Meeting today’s management needs while planning for the future

Pinellas County’s Urban Forest
Urban Forest

- **Urban forests are systems of trees, other vegetation, and water within any urban area.**
- **They can be understood as dynamic green infrastructure that provides cities and municipalities with environmental, economic, and social benefits.**
- **Urban forests are forests for people.**

Sustainability

- Managing the urban forest to meet the needs of the present without compromising the ability of future generations to meet their needs.*

*Commission on Environment and Development (WCED)
Pinellas County

- Most densely populated county in Florida
  - 3347 people per square mile
- County wide population ~1,000,000
- 280 miles²
- 588 miles of coastline
- 110 ft. at the highest location
- 4521 miles of paved road
Needs

- What are our needs from the Urban Forest?
- How does the Urban Forest function for us now?
- How do we want it to function for us in the future?
Continuity over time

- Comprehensive plan goals (10 year plans)
- Carbon output reduction: sequester carbon through green infrastructure: trees, plants, soil
- Minimum canopy cover
- Tree diversity and tree age and distribution
- Equity
Function

• Structure function and value
• Ecosystem services
  • Air quality improvement, stormwater runoff reduction, carbon storage, wildlife habitat, and energy conservation
• Goods
  • Food and wood products
• Value
  • Social, economic, and health benefits
  • Aesthetic
  • Monetary
Forces

- Climate change
- Storms and other natural disasters
- Insects
- Disease
- Age and decline of existing trees
- Invasive plants
- Development
- Equity
- Forest management
Management and design

- Species distribution
- Age class distribution
- Geographic distribution
- Management cycles
Seeing the Forest
How do we do it??

- **Ground up approach**
  - In the field traditional forestry
    - Urban tree inventories

- **View from above approach**
  - Present and future of traditional and urban forestry assessment
    - Point based tree canopy assessment
    - Remote sensing canopy assessment and planning
      - Satellite and LiDAR datasets
From the ground up

- Pinellas County Tree Inventory
  - iTree Streets data format
- Pinellas County Road Census
  - Windshield street tree counts
- Google Street View Asset Allocation
  - Street tree spatial locations
From the ground up

- Inventory: >11,000 trees measured
- Arterial census outputs: >15,000 trees counted (arterial roads)
- GSV Asset Allocation: Arterial road census follow-up
View from above approach

- Pinellas County Urban Tree Canopy Assessment
  - 35% canopy cover
  - 4000 points classified

- Pinellas County Urban Tree Canopy Cover
  - 43% canopy cover
  - LiDAR derived
View from above

- Point based canopy results

<table>
<thead>
<tr>
<th>Classification</th>
<th>Percent cover</th>
<th>CI</th>
<th>CI Min</th>
<th>CI Max</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree canopy</td>
<td>35%</td>
<td>1.5%</td>
<td>33%</td>
<td>36%</td>
<td>0.75%</td>
</tr>
<tr>
<td>Grass/ Low veg</td>
<td>29%</td>
<td>1.4%</td>
<td>28%</td>
<td>31%</td>
<td>0.72%</td>
</tr>
<tr>
<td>Impervious</td>
<td>28%</td>
<td>1.4%</td>
<td>27%</td>
<td>30%</td>
<td>0.71%</td>
</tr>
<tr>
<td>Bare soil</td>
<td>3%</td>
<td>0.6%</td>
<td>3%</td>
<td>4%</td>
<td>0.29%</td>
</tr>
<tr>
<td>Open water</td>
<td>4%</td>
<td>0.6%</td>
<td>4%</td>
<td>5%</td>
<td>0.32%</td>
</tr>
</tbody>
</table>
Pinellas County LiDAR Canopy Coverage
Planting for today and tomorrow

70% of trees inventoried in the genus Quercus (oaks): 35% live & 33% laurel

- Underutilized species
- Long lived species
- Broad environmental tolerance range
- Diverse structural forms
- Wind resistant species
- Armillaria resistant species
- Other pest and disease resistance
Sustainability

“The true meaning of life is to plant trees, under whose shade you do not expect to sit.” —Nelson Henderson.